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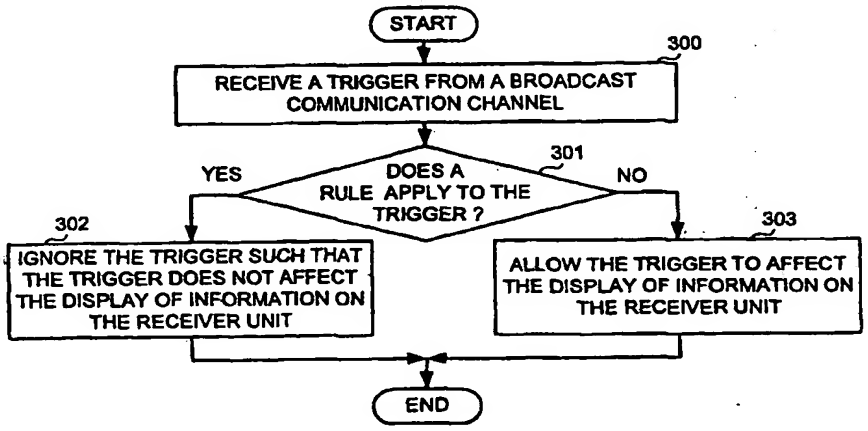

(57) Abstract

In interactive television, information from an information resource (119) may be displayed along with television video (117) in a synchronized fashion. When information is to be displayed at a point in the television video, a trigger (118) is broadcast along with the television video. The trigger identifies the information resource and indicates how information from the information resource is to be displayed. In accordance with the invention, a receiver unit (105) ignores some triggers whereas other triggers are not ignored. When the receiver unit receives a trigger, the receiver unit determines whether a rule (301) stored in the receiver unit applies to the trigger. If the rule applies, then the receiver unit takes a predetermined action. If the rule does not apply, then the rule has no effect and the trigger is acted upon by the receiver unit in normal fashion. In one embodiment, the predetermined action is to ignore the trigger. By including one or more such rules in the receiver unit, the receiver unit is made to ignore certain specific types of triggers but not to ignore others. The rules can be automatically loaded into the receiver unit on power-up by one-way broadcast communication over the airwaves, from a permanent storage device coupled to the receiver unit, or by downloading from the Internet. The rules can be updated periodically.

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ENABLING AND/OR DISABLING SELECTED TYPES OF BROADCAST TRIGGERS

BACKGROUND INFORMATION

Figure 1 (Prior Art) is a diagram of an interactive television system 100 that enhances a television viewing experience by integrating television programming with content from the Internet. The broadcast of a baseball game can, for example, be enhanced by retrieving relevant information (for example, a batter's batting statistics 101) from the Internet and displaying that information at an appropriate point in the baseball game (for example, when the batter 102 is batting).

System 100 includes a server 103 maintained by the broadcaster, a broadcasting antenna 104, a receiver unit 105, a television set 106, and an Internet access point 107. Receiver unit 105 includes a receiving antenna 108 and a remote control unit 109. A viewer uses remote control unit 109 to control the receiver unit and/or to interact with interactive television content via the receiver unit. A video link 110 couples receiver unit 105 to television set 106 so that the receiver unit can use the television set as a display device.

Figure 2 is a block diagram of receiver unit 105. TV interface circuitry 111 of the receiver unit 105 includes a tuner that is tuned to receive the broadcast television video and to remove a television carrier signal. After the carrier signal is removed, TV interface circuitry 111 digitizes the resulting video signal. Software executed by a digital processor 112 receives the digitized signal from TV interface 111 and decodes and checks the digitized signal for errors. Receiver unit 105 drives the television set 106 via video encoder 113 and audio digital-to-analog converter 114. Digital processor 112 realizes a type of web browser that can access the

Internet via a modem 115. Receiver unit 105 includes an infrared interface 116 for receiving infrared transmissions from remote control unit 109.

To enhance the baseball game by the display of batter statistics 101, television video 117 is broadcast over the airwaves from broadcasting antenna 104 to receiving antenna 108 of receiver unit 105. At an appropriate time in the baseball game when the broadcaster wishes batter statistics 101 to be displayed (for example, when batter 102 appears on the television screen), the broadcaster broadcasts a trigger 118 along with the television video 117. Trigger 118 contains a Uniform Resource Locator (URL) that identifies an information resource 119 on the broadcaster's server 103. In this case, information resource 119 is a web page containing the batter's statistics.

Receiver unit 105 receives trigger 118, accesses the Internet via Internet access point 107, uses the URL from the trigger to retrieve the web page of batter statistics from server 103, and then displays the batter statistics 101. In this way, broadcasters use triggers to have their viewers' receiver units retrieve information from the Internet and display that information in concert with their programming.

A service company may, for a fee, provide receiver units and Internet access to individuals viewers. The service company may not be an Internet Service Provider (ISP) that maintains the Internet access point. Rather, the service company contract with an ISP and then resell the Internet access to individual viewers. The service company may pay the ISP for the Internet activity of its viewers by the connect-hour. The service company therefore has an interest in controlling the magnitude of Internet accessing so that it can keep associated costs from exceeding the amount it bills its individual viewers.

As seen from the illustration of Figure 1, a broadcaster that transmits an unduly large number of triggers could cause the service company to incur large charges from the ISP. A

means of controlling such costs and inducing broadcasters to reimburse the service company for costs associated with their transmissions is desired.

SUMMARY

In interactive television, information from an information resource may be displayed along with television video in a synchronized fashion. When information is to be displayed at a point in the television video, a trigger is broadcast along with the television video. The trigger identifies the information resource and indicates how information from the information resource is to be displayed. Some triggers are ignored in accordance with the invention whereas other such triggers are not ignored. When the receiver unit receives a trigger, the receiver unit determines whether a rule stored in the receiver unit applies to the trigger. If the rule applies, then the receiver unit takes a predetermined action. If the rule does not apply, then the rule has no effect and the trigger is acted upon by the receiver unit in normal fashion (a default trigger handling condition). In one embodiment, the predetermined action is to ignore the trigger. By including one or more such rules in a receiver unit, the receiver unit is made to ignore certain specific types of triggers but not to ignore other types of triggers. The rules can be automatically loaded into the receiver unit on power-up by broadcast communication over the airwaves, from a permanent storage device (coupled to or a part of) the receiver unit, or by downloading from the Internet. The rules can be updated periodically.

A service company can cause receiver units to ignore certain types of triggers by causing the receiver units to load particular lists of rules. Accordingly, triggers from a particular broadcaster that does not reimburse the service company for costs associated with supporting the triggers can be disabled. It is therefore believed that a service company's capability to disable particular triggers may help induce

broadcasters to reimburse service companies for Internet access costs associated with supporting the broadcaster's triggers.

Other methods and structures are disclosed in the detailed description below. This summary does not purport to define the invention. The invention is defined by the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 (Prior Art) is a simplified diagram of an interactive television system employing triggers.

Figure 2 (Prior Art) is a block diagram of the receiver unit 105 of the system of Figure 1.

Figure 3 is a flowchart of a method in accordance with an embodiment of the present invention.

Figure 4 is a flowchart of a method in accordance with another embodiment.

Figure 5 is a flowchart of a method in accordance with another embodiment.

Figure 6 is a flowchart of a method in accordance with another embodiment.

Figure 7 is a diagram of a list of rules in accordance with an embodiment.

Figure 8 is a flowchart of a method in accordance with another embodiment.

Figure 9 is a block diagram of one embodiment of a receiver unit in accordance with the present invention.

Figure 10 is a more detailed block diagram of the TV interface circuitry 903 and the digital processor 904 of Figure 9.

Figure 11 is a flowchart of a method in accordance with another embodiment.

DETAILED DESCRIPTION

Figure 3 is a flowchart of a method in accordance with an embodiment of the present invention. First (step 300), a receiver unit receives a trigger from a broadcast communication

channel. The trigger has correct trigger syntax. The broadcast communication channel can, for example, be a television channel over which a television (audio and video) signal is broadcast. The television signal can, for example, be transmitted over the airwaves, via satellite, or through a cable television fiber optic or coaxial connection.

The receiver unit then (step 301) makes a determination whether a rule present in the receiver unit applies to the trigger. The rule may, for example, contain a string of characters which if present in the trigger indicates that the rule applies to the trigger. If the rule is determined to apply to the trigger, then the receiver unit ignores (step 302) the trigger in the sense that the trigger does not affect a display of information on the receiver unit. If, on the other hand, no rule is determined to apply to the trigger, then the trigger is handled in accordance with a default trigger handling condition. In this example, the default trigger handling condition is to allow the trigger (step 303) to affect the display of information on the receiver unit. A trigger may affect the display of information indirectly by reconfiguring or manipulating functionality of the receiver unit that later affects the display of information. The trigger may contain a script that that is executed on the receiver unit.

Figure 4 is a flowchart illustrating a situation wherein two triggers are received on a receiver unit, the rule applying to one of the triggers but not to the other. Both triggers have correct trigger syntax. First (step 400), the receiver unit determines that a rule does not apply to a first trigger received from a broadcast communication channel. The rule may be determined not to apply to the first trigger, for example, because a string in the rule is not found in the first trigger. Next (step 401), the receiver unit accepts the first trigger such that the first trigger affects a display of information on the receiver unit. The first trigger may, for example, cause web content (for example, an HTML or an XML web page) to be

displayed on a screen of the receiver unit along with television video. Next (step 402), the receiver unit determines that the rule does apply to a second trigger received from the broadcast communication channel. The rule may be determined to apply to the second trigger, for example, because a string in the rule is found in the second trigger. Next (step 403), the receiver unit ignores the second trigger in the sense that the second trigger does not affect the display of information on the receiver unit. The rule is therefore used by the receiver unit to filter triggers such that triggers to which the rule applies are ignored.

Figure 5 is a flowchart of a method in accordance with another embodiment of the present invention. First (step 500), a receiver unit receives a trigger from a broadcast communication channel. The trigger has correct trigger syntax. The receiver unit then (step 501) makes a determination whether a rule present in the receiver unit applies to the trigger. If a rule is determined to apply to the trigger, then the receiver unit allows the trigger (step 503) in the sense that the trigger affects the display of information on the receiver unit. If, on the other hand, no rule is determined to apply to the trigger, then the trigger is handled in accordance with a default trigger handling condition. In the example, the default trigger handling condition is to ignore the trigger (step 502) such that the trigger does not affect the display of information on the receiver unit.

Figure 6 is a flowchart illustrating a situation wherein two triggers are received on a receiver unit, the rule applying to one of the triggers but not to the other. Both triggers have correct trigger syntax. First (step 600), the receiver unit determines that a rule does not apply to a first trigger received from a broadcast communication channel. The rule may be determined not to apply to the first trigger, for example, because a string in the rule is not found in the first trigger. The receiver unit ignores the first trigger (step 601) in the

sense that the first trigger does not affect the display of information on the receiver unit. Next (step 602), the receiver unit determines that the rule does apply to a second trigger received from the broadcast communication channel. The rule may be determined to apply to the second trigger, for example, because a string in the rule is found in the second trigger. The receiver unit allows the second trigger (step 603) such that the second trigger affects the display of information on the receiver unit.

Figure 7 is an illustration of a list 700 of four rules 701-704 in accordance with another embodiment. Each rule has three fields 705-707. If the first field 705 contains the word "KILL", then the rule is a negative rule in the sense that a trigger to which the rule applies will be ignored. If the first field 705 contains the word "ALLOW", then the rule is a positive rule in the sense that a trigger to which the rule applies will not be ignored but rather will be processed in normal fashion by the receiver unit. In one embodiment, an icon for an enhancement afforded by the trigger appears on the screen of the receiver unit. If the viewer selects the icon using the remote control unit of the receiver unit, then the enhancement will be displayed. If the viewer does not select the icon within a certain amount of time, then the icon disappears and the enhancement is not displayed. There are, however, other triggers called "auto triggers" that cause enhancements to be displayed automatically without the user having to select an icon or take other action. These "auto triggers" are triggers that have an attribute called "AUTO". The default trigger handling condition for auto triggers is to ignore "auto triggers" unless they are enabled in the list of rules. If the first field contains the word "AUTO", then the rule is a positive rule that also allows specified auto triggers.

The second field 706 contains a match requirement. For a rule to apply to a given trigger, the trigger must meet the match requirement. In the example illustrated, the second field

706 contains characters and/or wildcards that define a character string that must be present in the trigger for the rule to apply. The asterisk symbol is a wildcard that represents any one or more characters. Accordingly, the "*MNF.HTML*" in the second field 706 of rule 701 indicates a trigger containing the character string MNF.HTML, where that character string is both preceded and followed by one or more other characters. In some embodiments, asterisks are assumed to be present both before and after strings in the second field such that the asterisks before and after "MNF.HTML" would be assumed and need not be included in the rule.

The third field 707 contains another match requirement. For a rule to apply to a trigger, the view attribute value in the third field of the rule must match the view attribute value of the trigger. Possible view attribute values are "TV", "WEB" and the wildcard value asterisk. If an asterisk is present in the third field 707 of a rule, then the trigger need not have any particular view attribute value in order for the rule to apply.

The view attribute value "TV" in a trigger indicates that the trigger is only applicable to receiver unit operation when the receiver unit is displaying television content (either only television content is being displayed or television content with enhancements are being displayed). The view attribute value "WEB", on the other hand, indicates that the trigger is only applicable to receiver unit operation when the receiver unit is displaying only web content (no television content is being displayed). A trigger having the view attribute "WEB" in a trigger, if activated by a viewer, could cause the receiver unit to leave the interactive television mode ("TV" mode) and go into the web only browser mode ("WEB" mode).

Figure 8 is a flowchart of method in accordance with another embodiment. The list 700 of rules 701-704 is first loaded (step 800) into the receiver unit. This list may be loaded into the receiver unit automatically on power-up of the

receiver unit or may already be present in memory. The list may be broadcast to the receiver unit (for example, by a one-way broadcast over the airwaves, over a satellite link, or over a cable connection) or may be received by the receiver unit over a packet-switched network (for example, over the Internet). On power-up, if a list of rules is not present or an updated list of rules is available, then the receiver unit may use a modem to establish a dial-up connection to the Internet and retrieve the list of rules from a web page (for example, an HTML or an XML web page). Thus, the receiver unit may update its rules periodically (for example, by receiving a broadcast communication of the rules or by retrieving the rules from a predetermined location on a network). The loading of these rules occurs automatically and is out of the control of the viewer. The rules, once loaded, preferably are not alterable by the viewer.

Next, the receiver unit receives a trigger from a broadcast channel (step 801). In one embodiment, the trigger has proper trigger syntax as set forth in: the "Advanced Television Enhancement Forum Specification (ATVEF)", draft version 1.1, revision 26 (1999); and the "Transport of Internet Uniform Resource Locator (URL) Information Using Text-2 (T-2) Service" standard EIA-746-A (the content of these two documents is incorporated herein by reference). The trigger may contain a script as set forth in U.S. patent application serial number ____, entitled "Communicating Scripts In A Data Service Channel Of A Video Signal", filed April 7, 1999, by Blackketter et al. (the content of this document is incorporated herein by reference). The trigger may have the following general form including multiple attribute/value pairs:

<http://www.broadcaster.com/program/mnf.html>[view:TV][script:__][checksum]

For additional information on triggers containing URLs usable in accordance with some embodiments, see: U.S. patent application serial number 09/099,118, entitled "Communicating Logical Addresses Of Resources In A Data Service Channel Of A Video

Signal", filed June 17, 1998, by Daniel J. Zigmond et al. (the content of this document is incorporated herein by reference).

Next (step 802), the receiver unit determines whether there are any rules stored in the receiver unit. If there are no rules (for example, no list was loaded), then the trigger is allowed (step 808). The trigger may, for example, affect the display of information on a screen of the receiver unit.

In one example, a trigger for which no rule applies (for example, because no rules are present in the receiver unit) is treated in accordance with a default trigger handling condition. In the illustrated example of Figure 8, the default trigger handling condition is to allow triggers. If it is determined there is no rule in step 802, then the trigger is allowed in step 808 and is processed in ordinary fashion by the receiver unit. Other default trigger handling conditions are, however, possible. In one example, a trigger for which no rule applies is ignored. In another example, some triggers for which no rule applies are allowed whereas others are ignored.

If there is a rule in the list of rules (step 802), then the trigger is checked (step 803) against the first rule in the list to determine whether the rule applies to the trigger. In the example of Figure 7, rule 701 would apply to any trigger that contains the string identified by the *mnf.html* in the second field 706. If rule 701 is determined by the receiver unit to apply to the trigger received in step 801, then processing proceeds to step 804. Because rule 701 is a negative rule, processing proceeds to step 805. The trigger is ignored such that the trigger does not affect the display of information on the receiver unit.

If, on the other hand, the rule is determined not to apply to the trigger in step 803, then rule 701 has no affect. Processing proceeds to step 806 where a determination is made as to whether there is another rule in list 700. Because there is another rule in list 700, processing proceeds to the next rule 702 (step 807).

The trigger received in step 801 is then checked against the second rule 702 (step 803) to determine whether the second rule 702 applies to the trigger. If rule 702 applies, then a determination is made (step 804) whether the rule is a positive rule or a negative rule. Rule 702 is a positive rule as indicated by the "ALLOW" in the first field 705.

Because the default trigger handling condition in this example is to allow triggers, application of such a rule would have no affect other than preventing the trigger from being tested against subsequent rules in the list. If, for example, second rule 702 is determined to apply to the trigger received in step 801, then processing proceeds to step 808, the trigger is allowed, and processing proceeds back to step 801 without the trigger being tested against the last two rules 703 and 704 of the list 700. It is therefore seen that including a positive rule in the list where the default trigger handling condition is to allow triggers provides a way of having certain types of triggers not be tested against subsequent rules.

If second rule 702 does not apply to the trigger received in step 801, then processing proceeds to step 806 and step 807 and the trigger is checked against the third rule 703 in step 803. If the third rule 703 is determined to apply to the trigger, then the trigger is ignored in step 805 and processing proceeds back to step 801. If, on the other hand, the third rule 703 is determined not to apply, then processing proceeds through steps 806 and 807 and the trigger is checked against the fourth rule 704.

If fourth rule 704 applies, then the trigger is an "auto trigger". Supporting such an auto trigger may be relatively expensive for a service company that provides the Internet access to users of receiver units. This is so because the receipt of an auto trigger may cause the receiver unit of a viewer to automatically initiate an Internet connection to retrieve web content. If a broadcaster is to broadcast such triggers that cause the service company to incur large Internet

costs, it may be desired to have the broadcaster reimburse the service company in some way. The service company may therefore only provide rules that enable the auto triggers of particular authorized broadcasters. If a broadcaster does not provide adequate compensation to a service company, then the service company can prevent the broadcaster from using auto triggers by removing the auto rules from the lists of rules in the receiver units.

If fourth rule 704 does not apply, then processing proceeds to step 806. Because the fourth rule 704 is the last rule in the list, processing proceeds to step 808. The trigger is then handled in accordance with the default trigger handling condition (in this example, the default trigger handling condition is to allow triggers that are not auto triggers).

Accordingly, a receiver unit can be made to have one of many different levels of functionality by tailoring the rules in the list. Receiving units can be made to treat triggers from different broadcasters differently. System reliability can be improved by having receiver units ignore triggers that would otherwise cause failures in the receiver. In some situations, test triggers are broadcast and it is not desired that receiver units of ordinary viewers act on these test triggers. By loading different rules into receiver units involved in the testing from the rules loaded into the receiver units of ordinary users, test triggers can be made to be received and operated on only by the desired receiver units involved in the test. Although the broadcast test triggers are received by the other receiver units, those other receiver units are made to ignore the test triggers.

Although the rules in the example of Figure 7 have particular fields, it is to be understood that numerous other types of rules for distinguishing some triggers from other triggers are possible in accordance with the invention. Although the method of Figure 8 parses the rules of the list 700 in sequential top-down order and exists the list after the

finding a rule that applies to the trigger, other methods of determining whether rules apply to triggers are possible.

For example, a rule may contain another field containing the text "CONNECT". If a positive rule containing such a field with the text "CONNECT" is determined to apply to a trigger, then the receiver unit allows the trigger to initiate an Internet connection. If a negative rule containing such a field with the text "CONNECT" is determined to apply to a trigger, then the receiver unit ignores the trigger. Alternatively, the receiver unit can allow the trigger to be processed but the receiver unit prevents the trigger from initiating a connection to the Internet.

Figure 9 is a block diagram of one embodiment of a receiver unit 900 that carries out the method of Figure 8. Receiver unit 900 is part of an interactive television system similar to system 100. In some embodiments, the receiver unit is integrated into a television set. In other embodiments the receiver unit and the television set are separate devices that are coupled together as illustrated in Figure 1. In other embodiments, the receiver unit is a part of a computer and the screen on which the television video is displayed connected to the computer.

Receiver unit 900 includes local storage 901, an infrared interface 902 for coupling the receiver unit to a remote control unit, TV interface circuitry 903 that receives a broadcast television signal, a digital processor 904, a modem 905 for coupling the receiver unit 900 to a network (for example, the Internet), an audio digital-to-analog converter 906 and a video encoder 907 for driving an ordinary analog television set. Although receiver unit 900 is coupled to the Internet via modem and an Internet access point, no such coupling is required. All of the triggers, web content, HTML and graphics for an interactive television system can be delivered by embedding them into the broadcast video signal 908.

Figure 10 is a more detailed view of the TV interface circuitry 903 and the digital processor 904 of Figure 9. A broadcast television signal 908 including interactive television triggers, announcements and data is received onto TV interface circuitry 903. A tuner 909 of the TV interface circuitry 903 is tuned to a broadcast channel containing the broadcast television signal 908 and removes a carrier signal. The resulting signal is then passed to a digitizer 910 of the TV interface circuitry 903. The resulting digitized information 918 is then supplied to digital processor 904. Data decoder software 911 realized by the digital processor 904 parses the digitized information 918 and extracts any triggers, announcements and data that are present. The triggers 912, announcements 913 and associated data 914 are supplied to browser software 915. Software that carries out the method of Figure 8 is represented as trigger filter block 916. Accordingly, some triggers pass through trigger filter block 916 whereas other triggers do not. The types of triggers that pass through and the types that do not are determined by the rules in the list of rules. The list of rules may, for example, be stored in local storage 901. Triggers 917 that pass through the trigger filter block 916 are generally acted upon in normal fashion by browser software 915. Browser software 915 may, for example, receive a trigger from trigger filter block 916, extract a Uniform Resource Identifier (URI) from the trigger, access the Internet via modem 915 to retrieve web content identified by the URI, merge the retrieved web content and television video together, and then drive the video encoder 907 and audio digital-to-analog converter 906 so that the merged content is displayed on a screen of a television in a fashion determined by the trigger. The URI in this example may be a Uniform Resource Locator (URL) that locates an information resource on the World Wide Web. In an alternate embodiment, the URI can access a file stored locally that includes the web content.

Figure 11 is a flowchart of a method in accordance with another embodiment. A trigger is received onto a receiver unit from a broadcast communication channel (step 1100). Next (step 1101), the receiver unit checks the trigger for proper syntax. If the trigger is uncorrupted and has proper syntax, then the receiver unit checks the trigger against a list of negative rules (step 1102) stored in the receiver unit. If any of the negative rules in the list applies, then the check fails and the trigger is ignored (step 1103). If, on the other hand, none of the negative rules applies, then processing proceeds to step 1104 where a determination is made of whether the receiver unit is currently displaying an enhancement. An enhancement may, for example, involve displaying information from a web (HTML or XML) page along with television video. If an enhancement is being displayed, then processing proceeds to step 1105. If a URI in the trigger matches the URI of the enhancement (for example, the URI is a URL and it matches the URL of the HTML or XML web page containing information that is being displayed), then processing proceeds to step 1106. If the trigger contains a script (step 1106), then browser software in the receiver unit executes the script (step 1107) thereby affecting the enhancement.

If, on the other hand, the receiver unit determines in step 1104 that an enhancement is not being displayed, then processing proceeds to step 1108. If the trigger is an "auto trigger", then the browser in the receiver unit acts on the trigger in step 1109. In one example, the receiver unit automatically establishes an Internet connection (for example, using a modem of the receiver unit), uses the URI of the trigger to retrieve web content identified by the URI, and displays the retrieved web content in a fashion specified by the trigger. The web content identified by the URI can be retrieved from either the broadcast communication channel or the Internet in accordance with techniques set forth in U.S. patent application serial number ____, entitled "Receiving An Information Resource From The Internet If It Is Not Received From A Broadcast Channel",

filed April 20, 1999, by Zigmond et al. (the content of which is incorporated herein by reference).

If, on the other hand, the trigger is not an "auto trigger", then processing proceeds from step 1108 to step 1110 where a prompt appears on the receiver unit screen querying the viewer whether the viewer wishes to view the enhancement. If the viewer confirms that the enhancement is to be viewed (step 1111), then the browser in the receiver unit acts on the trigger in step 1109. If the viewer fails to confirm that the enhancement is to be viewed in step 1111, then processing proceeds to step 1103 and the trigger is ignored.

In the embodiment of Figure 11, the default trigger handling condition is that auto triggers are enabled. Embodiments are possible, however, where the default trigger handling condition is that auto triggers are disabled. In such an embodiment, a positive rule must be applied in step 1102 in order for an auto trigger to be executed automatically as an auto trigger. If an auto trigger is received and no negative rule applies and no positive rule applies, then the auto trigger is handled in accordance with the default trigger handling condition for auto triggers (i.e., the auto trigger is ignored).

Although the present invention is described in connection with certain specific embodiments for instructional purposes, the present invention is not limited thereto. Different types of triggers that do not affect the display of information on a receiver unit can be distinguished from one another and treated differently using a trigger filter. A browser may include a filter for disabling messages other than triggers. A browser may, for example, include a filter that ignores certain types of announcements and allows of types of announcements. Different types of triggers can be handled in accordance with different default trigger handling conditions such that if no rule applies to a first trigger of a first type then the first trigger is handled in a first way, but if no rule applies to a second trigger of a second type then the second trigger is handled in a

second way. The receiver unit may receive broadcast video, triggers, rules, and web content all from a single cable modem connection. The structure of Figure 9 is but one of many embodiments of a receiver unit that can carry out methods in accordance with the present invention. A receiver unit can, for example, be realized using a computer and a tuner expansion card. Various functions of the receiver unit can be realized in software, in hardware, or both. Software and/or rules for implementing various features of the receiver unit can be stored on a computer-readable medium. Examples of computer-readable mediums include magnetic and optical storage media and semiconductor memory. Triggers can be broadcast over any suitable transport including vertical blanking interval (VBI) line 21 and/or lines 10-20 of an NTSC television signal. Accordingly, various modifications, adaptations, and combinations of various features of the described embodiments can be practiced without departing from the scope of the invention as set forth in the claims.

CLAIMS

What is claimed is:

1. A method, comprising:

(a) determining whether a rule applies to a trigger, the trigger having been received by a receiver unit from a broadcast communication channel; and

(b) if the rule is determined to apply to the trigger, then ignoring the trigger such that the trigger does not affect a display of information on the receiver unit; and

(c) if the rule is determined not to apply to the trigger, then allowing the trigger to affect the display of the information on the receiver unit.

2. The method of Claim 1, wherein:

the rule is determined in step (a) to apply to a first trigger, the first trigger being ignored in step (b) such that the first trigger does not affect the display of the information on the receiver unit, and

the rule is determined in step (a) not to apply to a second trigger, the second trigger affecting the display of the information on the receiver unit.

3. The method of Claim 2, wherein television video is received from the broadcast communication channel and wherein web content is received from a packet-switched network, the web content being identified by the second trigger, the television video and the web content being displayed at the same time on the receiver unit.

4. The method of Claim 1, wherein the rule includes a string, and wherein the rule is determined in step (a) not to apply to the trigger if the trigger does not contain the string, and wherein the rule is determined in step (a) to apply to the trigger if the trigger does contain the string.

5. The method of Claim 1, wherein steps (a), (b) and (c) are carried out in a browser of the receiver unit.

6. The method of Claim 1, wherein the information is information retrieved from a packet-switched network.

7. The method of Claim 1, wherein the information is a web page.

8. The method of Claim 1, wherein prior to step (a) the rule is received by the receiver unit from the broadcast communication channel.

9. The method of Claim 1, wherein prior to step (a) the rule is received by the receiver unit from a packet-switched network.

10. The method of Claim 1, wherein the receiver unit comprises a screen, television video being displayed on the screen.

11. The method of Claim 1, wherein the trigger comprises a Uniform Resource Identifier (URI), the URI identifying information stored on the receiver unit.

12. The method of Claim 1, wherein the trigger comprises a Uniform Resource Identifier (URI), the URI identifying information on a packet-switched network.

13. A receiver unit that receives both video information and triggers from a broadcast communication channel, some of the triggers being of a first type, others of the triggers being of a second type, the triggers of the first type and the triggers of the second type all having proper trigger syntax, comprising:

a browser; and

a trigger filter that does not pass the triggers of

the first type to the browser but that does pass the triggers of the second type to the browser.

14. The receiver unit of Claim 13, further comprising:

a rule stored in the receiver unit, the trigger filter using the rule to determine if a trigger is of the first type.

15. The receiver unit of Claim 13, wherein the receiver unit is coupled to a packet-switched network, the receiver unit receiving information from the packet-switched network, the browser causing both the information from the packet-switched network and the video information from the broadcast communication channel to be displayed on the receiver unit at the same time.

16. A receiver unit that receives both video information and a trigger from a broadcast communication channel, comprising:

means for ignoring the trigger if the trigger is of a first type;

means for executing the trigger such that the trigger affects a display of information on a screen of the receiver unit if the trigger is of a second type; and

means for linking the receiver unit to a packet-switched network, information from the packet-switched network being displayed on the screen of the receiver unit along with the video information received from the broadcast communication channel.

17. The receiver unit of Claim 16, wherein the means for ignoring includes a plurality of rules, wherein the means for executing includes a browser, and wherein the means for linking includes a modem.

18. The receiver unit of Claim 16, wherein the means for

ignoring checks the trigger against a rule, wherein if a string present in the rule is not present in the trigger then the trigger is of the first type and the trigger is ignored.

19. The receiver unit of Claim 18, wherein the rule is received onto the receiver unit from the packet-switched network.

20. The receiver unit of Claim 18, wherein the receiver unit automatically retrieves the rule on power-up from the packet-switched network.

21. The receiver unit of Claim 16, wherein the video information, the trigger, and the information from the packet-switched network are communicated to the receiver unit via one of a fiber optic cable or a coaxial cable.

22. A method of testing, comprising:

loading a rule into a first receiver unit, the rule not being present in a second receiver unit, the first receiver unit and the second receiver unit being substantially structurally identical;

transmitting a test trigger to the first receiver unit and to the second receiver unit;

the first receiver unit receiving the test trigger and using the rule to determine that the test trigger is to be ignored, the test trigger not affecting a display of information on the first receiver unit; and

the second receiver unit receiving the test trigger, the test trigger affecting a display of information on the second receiver unit.

23. A method of preventing a failure in a receiver unit due to a first trigger, comprising:

loading a rule into the receiver unit;

the receiver unit receiving the first trigger and using the rule to determine that the first trigger is to be ignored, wherein had the first trigger not been ignored then the first trigger would have caused the failure in the receiver unit; and

the receiver unit receiving a second trigger and not ignoring the second trigger, the second trigger affecting a display of information on the receiver unit.

24. A method of receiving triggers and displaying associated web content on a receiver unit, comprising:

receiving a first trigger of a first type and a second trigger of a second type;

filtering the first trigger from the second trigger; and

displaying web page content in response to the first trigger but not in response to the second trigger.

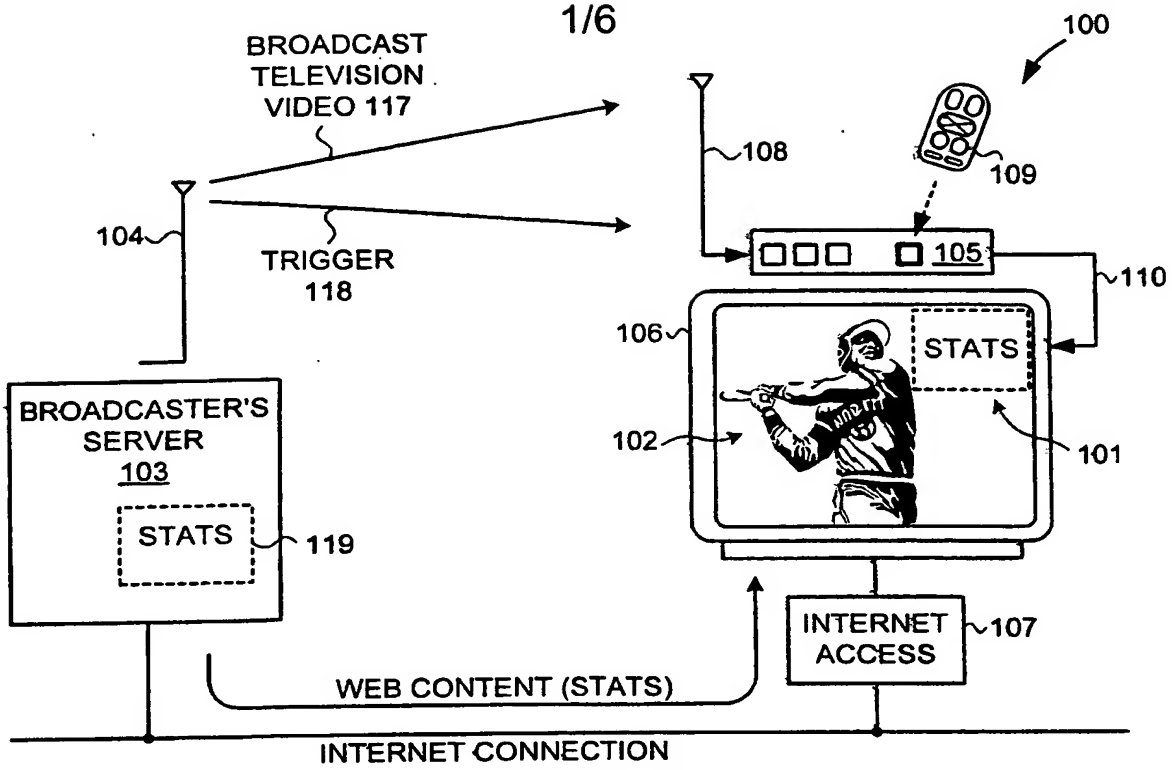

FIG. 1
(Prior Art)

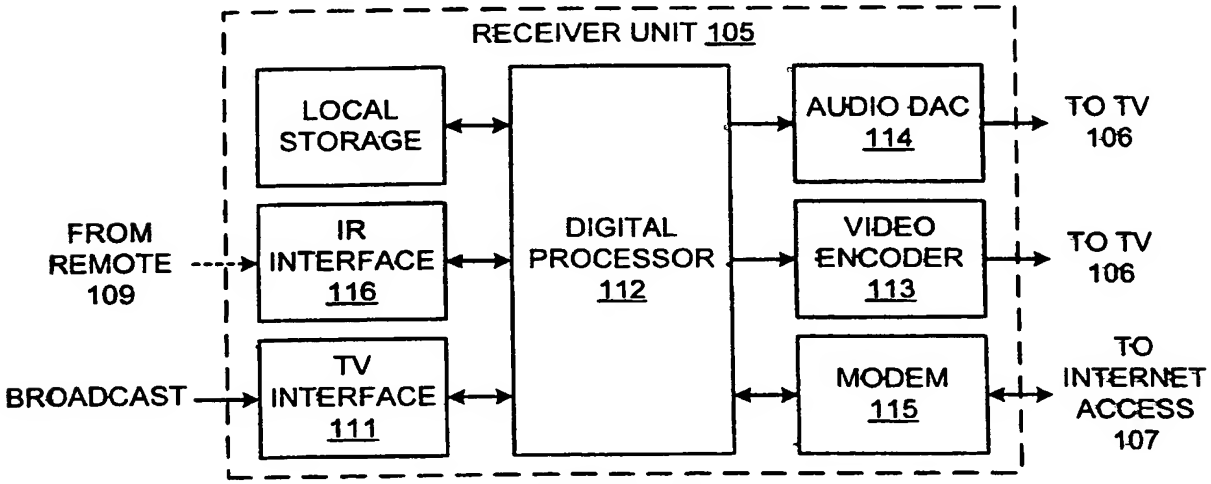

FIG. 2
(Prior Art)

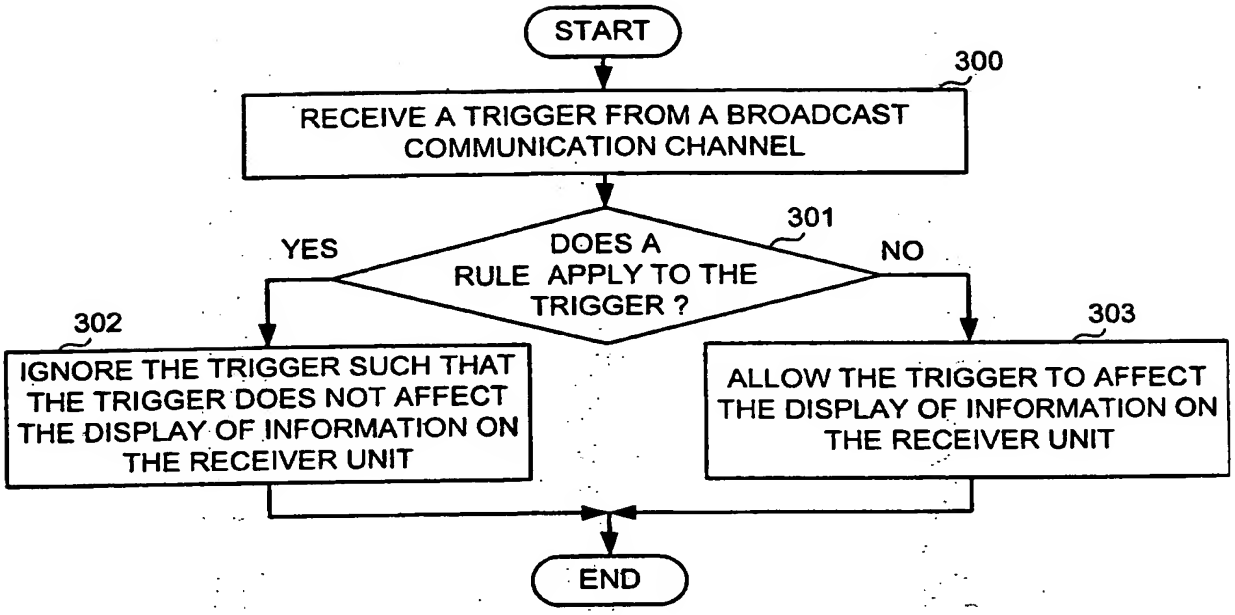
START
300
RECEIVE A TRIGGER FROM A BROADCAST COMMUNICATION CHANNEL
301
DOES A RULE APPLY TO THE TRIGGER ?
YES
NO
302
IGNORE THE TRIGGER SUCH THAT THE TRIGGER DOES NOT AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
303
ALLOW THE TRIGGER TO AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
END

FIG. 3

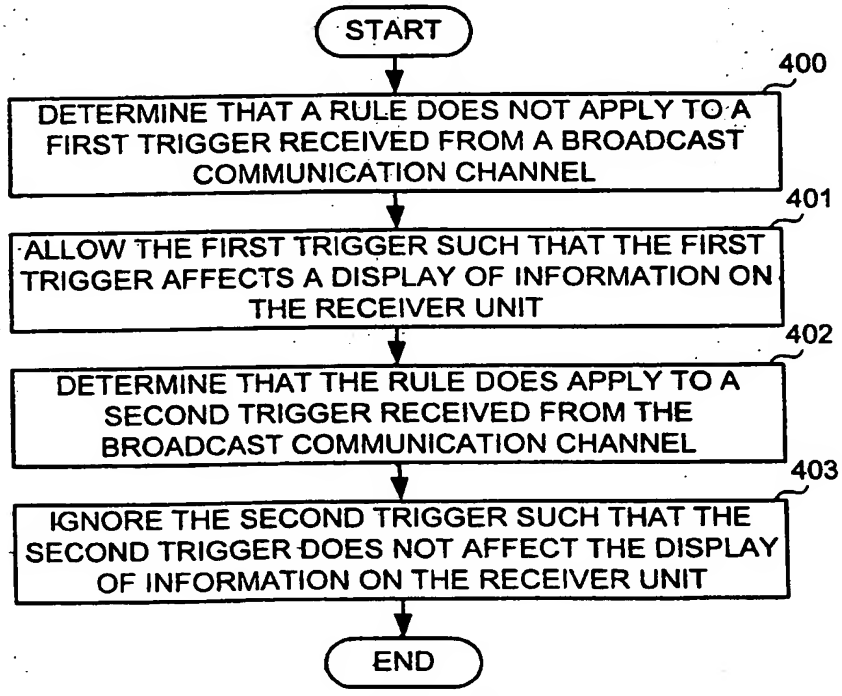
START
400
DETERMINE THAT A RULE DOES NOT APPLY TO A FIRST TRIGGER RECEIVED FROM A BROADCAST COMMUNICATION CHANNEL
401
ALLOW THE FIRST TRIGGER SUCH THAT THE FIRST TRIGGER AFFECTS A DISPLAY OF INFORMATION ON THE RECEIVER UNIT
402
DETERMINE THAT THE RULE DOES APPLY TO A SECOND TRIGGER RECEIVED FROM THE BROADCAST COMMUNICATION CHANNEL
403
IGNORE THE SECOND TRIGGER SUCH THAT THE SECOND TRIGGER DOES NOT AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
END

FIG. 4

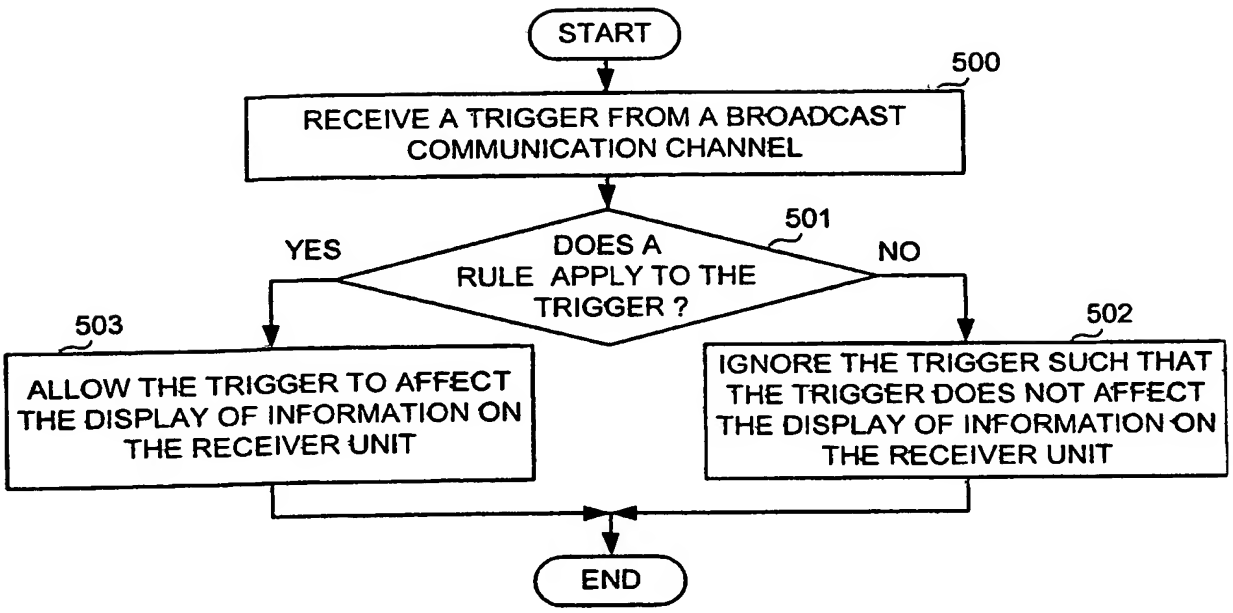
START
500
RECEIVE A TRIGGER FROM A BROADCAST COMMUNICATION CHANNEL
501
DOES A RULE APPLY TO THE TRIGGER ?
YES
NO
503
ALLOW THE TRIGGER TO AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
502
IGNORE THE TRIGGER SUCH THAT THE TRIGGER DOES NOT AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
END

FIG. 5

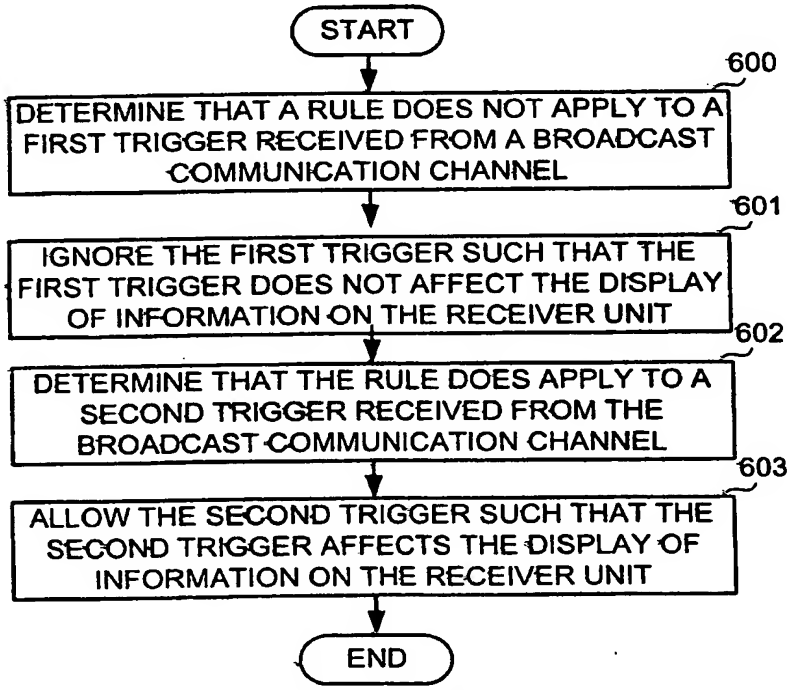
START
600
DETERMINE THAT A RULE DOES NOT APPLY TO A FIRST TRIGGER RECEIVED FROM A BROADCAST COMMUNICATION CHANNEL
601
IGNORE THE FIRST TRIGGER SUCH THAT THE FIRST TRIGGER DOES NOT AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
602
DETERMINE THAT THE RULE DOES APPLY TO A SECOND TRIGGER RECEIVED FROM THE BROADCAST COMMUNICATION CHANNEL
603
ALLOW THE SECOND TRIGGER SUCH THAT THE SECOND TRIGGER AFFECTS THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT
END

FIG. 6

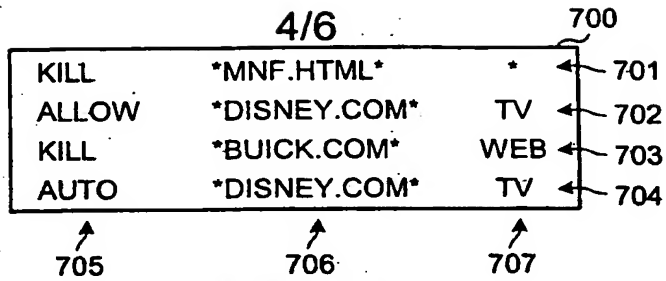
700
KILL *MNF.HTML* * 701
ALLOW *DISNEY.COM* TV 702
KILL *BUICK.COM* WEB 703
AUTO *DISNEY.COM* TV 704
705
706
707

FIG. 7

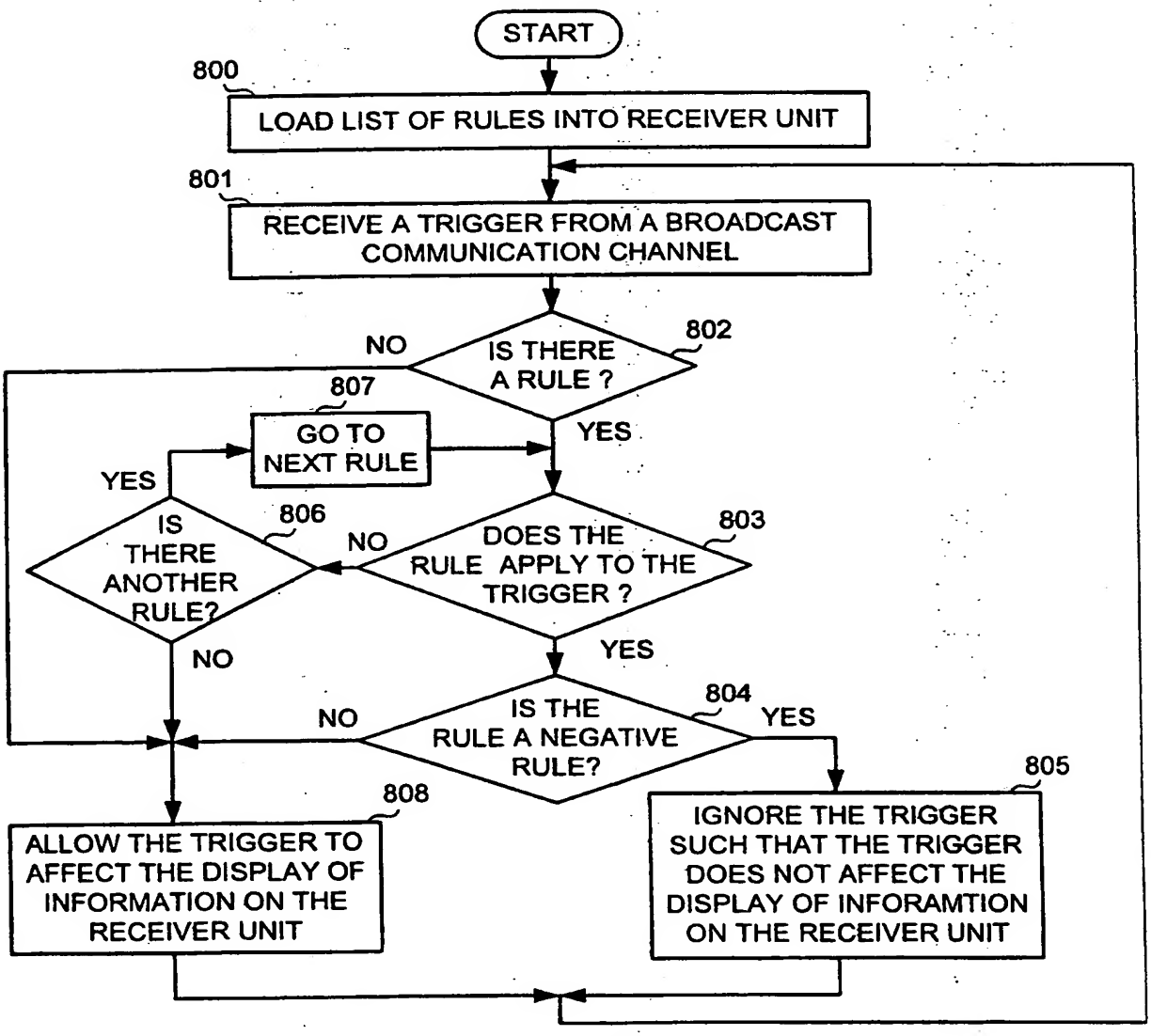
START
800
LOAD LIST OF RULES INTO RECEIVER UNIT
801
RECEIVE A TRIGGER FROM A BROADCAST COMMUNICATION CHANNEL
802
IS THERE A RULE ?
NO
YES
807
GO TO NEXT RULE
YES
806
IS THERE ANOTHER RULE?
NO
803
DOES THE RULE APPLY TO THE TRIGGER ?
NO
YES
804
IS THE RULE A NEGATIVE RULE?
NO
YES
805
IGNORE THE TRIGGER SUCH THAT THE TRIGGER DOES NOT AFFECT THE DISPLAY OF INFORAMTION ON THE RECEIVER UNIT
808
ALLOW THE TRIGGER TO AFFECT THE DISPLAY OF INFORMATION ON THE RECEIVER UNIT

FIG. 8

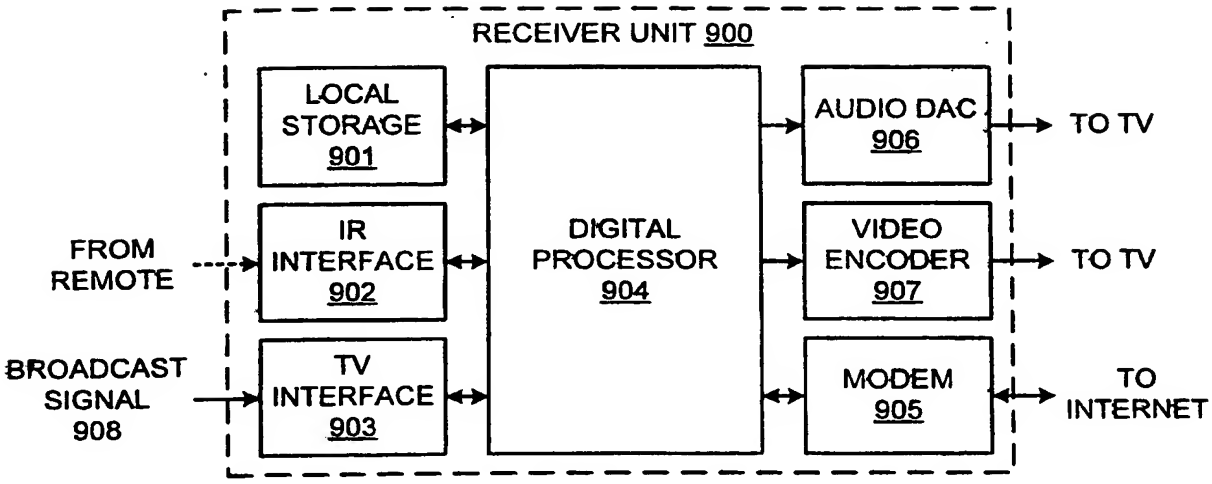
RECEIVER UNIT 900
LOCAL STORAGE 901
IR INTERFACE 902
TV INTERFACE 903
DIGITAL PROCESSOR 904
AUDIO DAC 906
VIDEO ENCODER 907
MODEM 905
FROM REMOTE
BROADCAST SIGNAL 908
TO TV
TO TV
TO INTERNET

FIG. 9

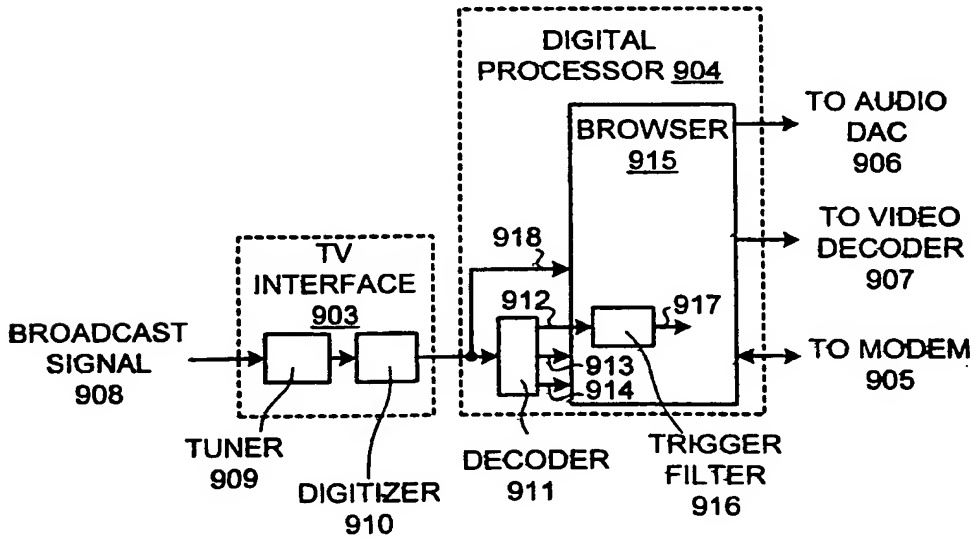
DIGITAL PROCESSOR 904
BROWSER 915
TV INTERFACE 903
BROADCAST SIGNAL 908
TUNER 909
DIGITIZER 910
DECODER 911
TRIGGER FILTER 916
912
913
914
917
918
TO AUDIO DAC 906
TO VIDEO DECODER 907
TO MODEM 905

FIG. 10

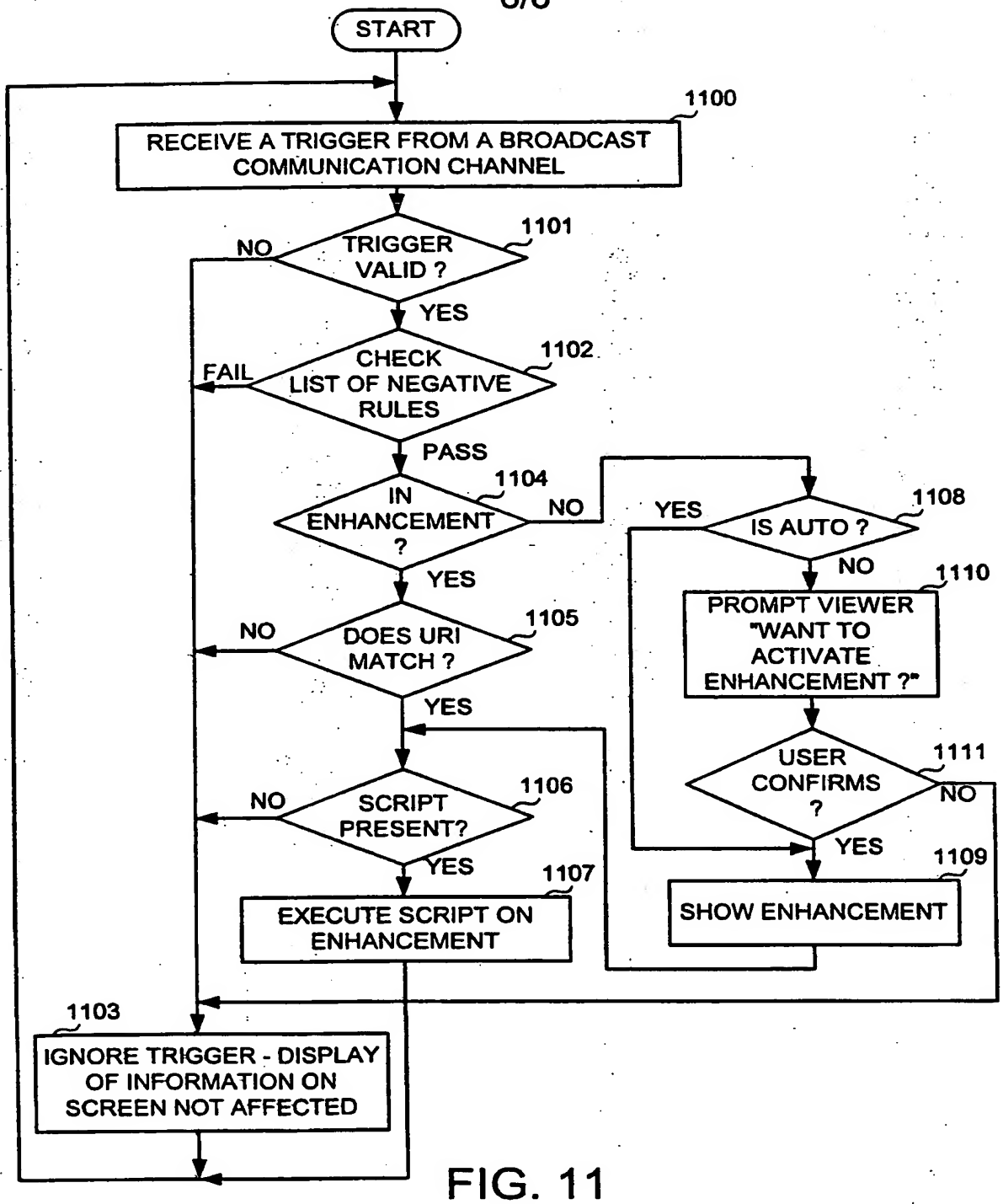
START
1100
RECEIVE A TRIGGER FROM A BROADCAST COMMUNICATION CHANNEL
1101
TRIGGER VALID ?
NO
YES
1102
CHECK LIST OF NEGATIVE RULES
FAIL
PASS
1104
IN ENHANCEMENT ?
NO
YES
1108
IS AUTO ?
YES
NO
1110
PROMPT VIEWER "WANT TO ACTIVATE ENHANCEMENT ?"
1105
DOES URI MATCH ?
NO
YES
1111
USER CONFIRMS ?
NO
YES
1106
SCRIPT PRESENT?
NO
YES
1109
SHOW ENHANCEMENT
1107
EXECUTE SCRIPT ON ENHANCEMENT
1103
IGNORE TRIGGER - DISPLAY OF INFORMATION ON SCREEN NOT AFFECTED

FIG. 11

INTERNATIONAL SEARCH REPORT

Internat Application No
PCT/US 00/10765

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N7/16 H04N7/088

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 41020 A (ACTV INC) 17 September 1998 (1998-09-17) page 6, line 1 - line 8 page 9, line 1 -page 10, line 17 page 28, line 12 -page 33, line 4	1-24
A	"Advanced Television Enhancement Forum Specification (ATVEF), Comment Draft Version 1.0r1" 'Online! XP002142688 Retrieved from the Internet: <URL: www.intercast.org/atvef_spec/TVE-public.htm> 'retrieved on 1999-02-25! -Using Enhanced TV-	1-24

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 July 2000	31/07/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Beaudoin, O

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Internat Application No
PCT/US 00/10765

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9841020 A	17-09-1998	AU 3370597 A	29-09-1998
		EP 0965227 A	22-12-1999
		GB 2343095 A	26-04-2000
		GB 2338388 A,B	15-12-1999